

Customer No.: 31561

Docket No.: 13155-US-PA

Application No.: 10/711,003

**REMARKS****Present Status of the Application**

Claims 1-8 are objected to because appropriate correction is required. The Office Action rejected claims 1-2 under 35 U.S.C. 102(a), as being anticipated by Chung et al. (U.S. 2003/0203589). The Office Action also rejected claims 6-8 under 35 U.S.C. 103(a) as being unpatentable over Chung in view of Fang (U.S. 2005/0158966). In particular, the office action stated claims 3-5 would be allowable if rewritten to overcome the objections and to include all of the limitations of the base claim and any intervening claims.

Applicants have amended claims 1, 4-8 to correct the typographic errors.

Applicants have amended claims 1 and 6 and canceled claims 2-3 to more clearly define the present invention. After entry of the foregoing amendments, claims 1, 4-8 remain pending in the present application, and reconsideration of those claims is respectfully requested.

**Discussion of Office Action Objections**

Claims 1-8 are objected to because of typographic errors. Applicant has amended the typographic errors to overcome the objections.

In claim 1, "reducing wafer" after "for reducing wafer scratch" is deleted; "scratch" before "comprising the steps of" is deleted; "reducing" before "a step" is replaced with --reduce--; and "compared" before "that without adjusting" is followed by --a--.

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In claim 6, "scratchprocess of fabricating a shallow trench isolation structure" is deleted and "scratch" is added after "for reducing wafer".

In claim 7, "the laser beam" is amended into "a laser beam"; and "step of controlling the parameter of the laser marking operation includes adjusting an energy of the laser beam.." is amended into "the energy of the laser beam....".

In claim 8, "the step of controlling the parameter in the laser marking operation comprises reducing..." is amended into "the step height is reduced....".

**Claims 1-2 rejected under 35 U.S.C 102 (a)**

*The Office Action rejected claims 1-2 under 35 U.S.C. 102(a), as being anticipated by Chung et al. (U.S. 2003/0203589). The office action also stated claims 3-5 would be allowable if rewritten to overcome the objections and to include all of the limitations of the base claim and any intervening claims.*

Applicant has added the limitation of claim 3 into claim 1. Applicant respectfully submits claim 1 is allowed because claim 1 includes all of the limitations of the allowable claim 3, and dependent claims 4-5 should also be allowed as a matter of law.

**Rejection under 35 U.S.C 103 (a)**

*Applicants respectfully traverse the rejection of claims 6-8 under 103(a) as being unpatentable over Chung et al. (US 2003/0203589) in view of Fang et al. (US*

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*2005/0158966) because a prima facie case of obviousness has not been established by the Office Action.*

To establish a prima facie case of obviousness under 35 U.S.C. 103(a), each of three requirements must be met. First, the reference or references, taken alone or combined, must teach or suggest each and every element in the claims. Second, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the references in a manner resulting in the claimed invention. Third, a reasonable expectation of success must exist. Moreover, each of the three requirements must "be found in the prior art, and not be based on applicant's disclosure." See M.P.E.P. 2143, 8<sup>th</sup> ed., February 2003.

The present invention provides a method of fabricating a shallow trench isolation structure for reducing wafer scratch as claim 6 recites:

6. A method of fabricating a shallow trench isolation structure for reducing wafer scratch, comprising the steps of:  
providing a substrate;

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performing a laser marking operation to form a laser mark on the substrate, wherein at least a protrusion is formed during the laser marking operation due to an amassment of material, and *wherein an energy of a laser beam of the laser marking operation is adjusted to reduce a step height of the protrusion compared to that without adjusting the parameter;*

forming a patterned mask layer over the substrate;

etching the substrate using the patterned mask layer as an etching mask to form a trench;

forming an insulation layer over the substrate, wherein the insulation layer completely fills the trench;

removing a portion of the insulation layer by performing a chemical-mechanical polishing process; and

removing the patterned mask layer.

Chung and Fang fail to teach or suggest that "an energy of a laser beam of the laser marking operation is adjusted to reduce a step height of the protrusion compared to that without adjusting the parameter". The office action also agrees this limitation is not disclosed in the Chung reference because the office action states the original claim 3 is allowable.

In addition, Fang teaches a method to eliminate a step high to obtain a semiconductor process wafer having substantially coplanar active areas and a laser marked area. In this

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method, a trench opening 30A, 30B for STI and a opening 30C formed in the laser mark area 28 are formed (Fig. 2C); a STI oxide 31 is formed over the substrate 22 (Fig. 2D); a patterned PR is formed on the STI oxide 31 (Fig. 2E or Fig. 2F); etching the STI oxide 31 by using the patterned PR as mask Fig. 2G); and a CMP process is performed to the remained STI oxide 31 after the patterned PR is removed so as to form a coplanar structure (Fig. 2H). Fang does not teach or suggest the step of "performing a laser marking operation to form a laser mark on the substrate, wherein at least a protrusion is formed during the laser marking operation due to an amassment of material, and *wherein an energy of a laser beam of the laser marking operation is adjusted to reduce a step height of the protrusion compured to that without adjusting the parameter*".

Therefore, Fang cannot cure the deficiencies of Chung. The two references combined do not teach or suggest each and every element in the claim 6, and thus a prima facie case of obviousness for claim 6 has not been established by the Office Action. For at least the foregoing reasons, Applicant respectfully submits that independent claim 6 patently define over the prior art references, and should be allowed. For at least the same reasons, dependent claims 7-8 patently define over the prior art as a matter of law.

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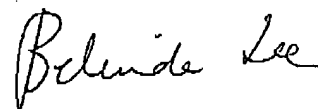
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**CONCLUSION**

For at least the foregoing reasons, it is believed that the pending claims are in proper condition for allowance. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

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Respectfully submitted,



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